Remarks/Arguments:

Claims 1-21 are the pending claims in this application.

Claims 6, 7, 13, and 14 were objected to under 37 CFR §1.75(c) because they were in improper form as multiple dependent claims dependent on other multiple dependent claims. The claims have been amended to remove all multiple dependencies. Accordingly, the Applicants request withdrawal of this objection and request that these claims be treated on the merits.

Claims 1, 2, and 8 stand rejected under 35 U.S.C. §112, second paragraph, as indefinite. Claim 1 has been rejected because it was not clear to what product the "application" of step (c) was applied. Claim 1, and claim 8, have been amended to clarify that the applying step of step (c) is done to the fired, catalysed gas diffusion electrode. Support for this amendment is found in the application, for example in Example 1 (with reference to the firing step in Comparative Example 1). Withdrawal of this rejection is respectfully requested.

Claim 2 has been rejected because it was not clear whether the term N,N-dimethylacetamide is referring to a solvent or the proton-conducting polymer. Claim 2, and claim 9, have been amended to recite that the solvents comprise N,N-dimethylacetamide. Support for this amendment is found in the application at, for example, page 8, lines 5-8. Withdrawal of this rejection is respectfully requested.

Claim 8 has been rejected as steps (a) and (b) were deemed confusing and due to a concern over prior step (e). The clarifying amendments to steps (a) and (b), as suggested by the Examiner, have been made. Prior step (e), now step (d), was deemed confusing because it was not clear how and by what process the electrode and polymer are combined. First, claim 8 has been amended to clarify that it is the proton conduction polymer *membrane* which is combined with the gas diffusion electrode. The Applicants submit that this amendment clarifies the claim fully. For completeness, the Applicants note that the methods of combining a gas diffusion electrode with a proton conducting polymer membrane were well-known and made clear from the application. See, for example, page 8, lines 13-16. It should be pointed out that in step (c), the proton conducting polymer is in solution form and is part of the gas diffusion electrode, whereas in step (d) (formerly step (e)), the proton conducting polymer membrane is

a solid membrane and forms the electrolyte between the anode and cathode. In view of the amendments and these remarks, withdrawal of this rejection is respectfully requested.

Claims 1-5 and 8-12 stand rejected under 35 U.S.C. §103(a) as obvious over Hards et al. (U.S. Patent No. 5,501,915) in combination with Weber, "Study of Nafion Films on Electrodes Prepared from Dimethylacetamide Solution." The Office Action alleges that Hards et al. teaches a method of incorporating a proton conducting polymer into an electrocatalyst layer wherein a catalyst layer is applied to a gas diffusion substrate, and a solution of proton conducting polymer is subsequently applied to the catalyst layer. The Office Action states that the electrocatalyst is formulated into a catalyst ink by dispersing in water and adding a suitable binder. The Office Action also alleges that Hards et al. discloses applying the catalyst ink to the gas diffusion substrate and then applying a solution of a proton conducting polymer to the electrocatalyst layer. The Office Action uses Weber to satisfy the limitation of the claimed solvent, N,N-dimethylacetamide.

The Applicants contend that Hards et al. does not disclose the claimed process and that the Office Action fails to appreciate the claim limitation of "firing the catalysed gas diffusion substrate to form a fired, catalysed gas diffusion electrode," as called for in step (b) of claims 1 and 8. With this in mind, it is clear that Hards et al. fail to satisfy all of the limitations of the claims. In particular, the claimed invention applies the catalyst ink to the substrate, fires the catalysed substrate to remove the solvents and then applies the proton conducting polymer solution. Hards et al. prepares an 'ionomer component' by wetting the catalyst, then adds the Nafion solution and then evaporates the solvents to provide a powder. The powder of catalyst and Nafion is then mixed with the 'gas supplying component,' dispersed in suitable liquid medium and applied to a substrate (see column 5, lines 33 to 51 and column 6, lines 13 to 35). A further layer of solubilized proton conducting polymer may then be applied to the front face of the electrode structure. Furthermore, and as mentioned above, there is no firing step in Hards et al., as required by the claimed invention.

Moreover, the applicants contend that there is simply no satisfactory reason, as required to support a case of *prima facie* obviousness, to combine Weber with Hards et al. in the way that the Examiner has done. The only reason supplied by the Office Action for doing so, namely "with the expectation of achieving similar success," is not adequate. In short, there is nothing in Weber that would have made it obvious to add N,N-dimethylacetamide to the proton conducting polymer solution to improve the catalyst utilization in the catalyst layer. In fact, in

Weber, a Nafion membrane is dissolved in N,N-dimethylacetamide (DMAA), the Nafion/DMAA solution is spread on a glass plate, and the DMAA is then evaporated. Therefore, in the membrane formed in Weber, there is no DMAA because it has been evaporated. Furthermore, there is nothing that suggests adding DMAA to the catalyst layer.

For these reasons, the Applicants contend that the claimed invention is not obvious over Hards et al. in combination with Weber.

In view of the foregoing amendments and remarks, the Applicants respectfully request reconsideration and allowance of the pending claims.

Respectfully submitted,

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Attachment: Abstract

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